IMPLEMENTING A HAVERSINE ALGORITHM IN MOBILE APPLICATION TO FIND THE NEAREST REPAIR SHOP USING MAPBOX API INTEGRATION

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ABSTRACT

The automotive industry in Indonesia is experiencing rapid growth, driven by increasing per capita income and changing lifestyles, which fuel high demand for transportation. One sector that has seen significant expansion is the motorcycle repair shop business. This study aims to develop an Android-based service application for motorcycle repair shops, incorporating the Haversine algorithm to calculate distances and assist customers in locating the nearest repair shop. Testing indicates a high level of accuracy, with distance calculations differing by only ±0.01 km to ±0.06 km. A comparison between the Mapbox and Google Maps platforms reveals identical route results, positioning Mapbox as a competitive alternative. Communication tests conducted via the chat feature demonstrate a response time ranging from 100 to 700 milliseconds, with Wi-Fi proving to be more stable than cellular networks. The application was tested on three devices, with two successful installations and one failed, indicating a minimum compatibility level of Android 10. The functional testing, which utilized the Black-Box Testing method, encompassed 37 scenarios, comprising 13 customer tests, 8 repair shop tests, and 16 admin tests, attaining a 99% success rate. The study's findings demonstrate that the application has met its functional specifications and can adequately support user needs at all operational levels.

Keywords*: haversine algorithm, mobile application, repair shop service, repair shop search.*